

REMARKS

Claim Rejections under 35 USC § 103

The Examiner has rejected claims 1-5, 9-11 as being unpatentable over Pelekhaty (U.S. Patent No. 6,215,592) in view of Mitsui (U.S. Patent No. 6,042,752). The Examiner has rejected claim 6 as being unpatentable over Pelekhaty in view of Mitsui as applied to claim 4, and further in view of Goosen (U.S. Patent No. 5,914,804), and has also rejected claim 8 as being unpatentable over Pelekhaty in view of Mitsui as applied to claim 5 above, and further in view of Adair (U.S. Patent No. 6,490,381).

In response to this rejection, applicant has amended independent claims 1 and 11, adding limitations which define over the prior art cited by the Examiner in this Office Action.

Regarding claim 1, a thin film filter for dense wavelength division multiplexing, the thin film filter comprises a glass substrate and a film stack mounted on the glass substrate, the film stack including a plurality of cavities; wherein each cavity comprises a first mirror layer, a second mirror layer, and a spacer layer arranged therebetween, both of the first mirror layer and the second mirror layer including low refractive index thin films and *high refractive index thin films consisting of a composition of indium-tin oxide which has a high refractive index*, therefore, a substantially different refractive index between the low refractive index thin films and the high refractive index thin films is formed.

The Examiner argues that it is obvious, because Pelekhaty teaches a thin film filter for dense wavelength division multiplexing, the filter comprising a glass substrate, a film stack on the glass substrate comprising low refractive index thin films and high refractive index thin films, and Mitsui teaches the use of tin oxide including indium as a thin film light transmissive layer.

Applicant disagrees with the Examiner at this point, and the detailed will be described as follows.

Firstly, Pelekhaty reference relates to an optical filter, however, Mitsui reference relates to a transparent conductive film. It wouldn't be proper to combine these two disparate cited references since they are from *unconnected fields*, and thus it would not obvious to combine them. Mitsui discloses a transparent conductive film of tin oxide containing gallium oxide and indium oxide, however, neither gallium oxide nor indium oxide is used in an optical filter. There is *no suggestion that indium-tin oxide should be used in the optical filter to form a substantially different refractive index* between low refractive index thin films and high refractive index thin films from reading the cited references or combinations thereof.

Secondly, if a combination merely provides the sum of the results of its components, each component working individually and not enhancing the working of any other component, the combination would be unpatentable. However, the indium-tin oxide cooperates with a low refractive index thin film to form a substantially different refractive index such that numbers of layers are reduced and internal film stress of the optical filter is greatly eliminated. This is surly *important* and *significant* in optical industry, because the optical thin filter of the instant

invention is *more resistant to internal stress* in the film layers, which is helpful to enhance rate of success during manufacture. In addition, a lower insertion loss is achieved using the optical filter of the instant invention.

This *novel* structure of the optical filter of the instant invention produces *unexpected and surprising advantages*, therefore, should be considered as non-obvious.

For the above-mentioned reasons, the amended claim 1 is believed to be in condition for allowance. The amended claims 2-3, 6, 9-10 and unchanged claim 7 depend directly or indirectly from claim 1, so should also be in condition for allowance.

Regarding claim 8, the combination of silicon oxide with indium tin oxide is *not* used to solve the problems of *internal film stress in an optical filter*. Due to the multi-layer design and film deposition process of multiple cavities in film stack, the internal film stress is very high which make the film stack deposition extremely difficult to contain the insertion loss. The instant invention has overcome this severe problems in the optical filter by utilizing indium-tin oxide with the low refractive index material, which is not suggested in any cited references or combinations thereof. Therefore, claim 8 should be considered as non-obvious and should be in condition for allowance.

Regarding independent claims 11, the Applicant has added more limitations thereto which define over the cited references in this Office Action. By the way, Applicant asserts that 160 layers could not be anticipated by or obvious to 50 layers which the Examiner mistreated in the office action, page 4, lines 6-7. In fact,

from the manufacturing viewpoint, they are far away from each other. Therefore, it should be in condition for allowance.

New dependent claims 12-14 depend directly or indirectly from the claim 11, therefore, they should also be in condition for allowance.

In view of the above claim amendments and remarks, the subject application is believed to be in a condition for allowance and an action to such effect is earnestly solicited.

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